**CODE:**

**#include** "main.h"

**#include** "lcd.h"

**#include** "stdlib.h"

/\* Private includes ----------------------------------------------------------\*/

/\* USER CODE BEGIN Includes \*/

/\* USER CODE END Includes \*/

/\* Private typedef -----------------------------------------------------------\*/

/\* USER CODE BEGIN PTD \*/

/\* USER CODE END PTD \*/

/\* Private define ------------------------------------------------------------\*/

/\* USER CODE BEGIN PD \*/

/\* USER CODE END PD \*/

/\* Private macro -------------------------------------------------------------\*/

/\* USER CODE BEGIN PM \*/

/\* USER CODE END PM \*/

/\* Private variables ---------------------------------------------------------\*/

TIM\_HandleTypeDef htim1;

/\* USER CODE BEGIN PV \*/

**unsigned** **char** flag = 0;

uint16\_t hh, h, mm, m, ss, s, temp;

/\* USER CODE END PV \*/

/\* Private function prototypes -----------------------------------------------\*/

**void** **SystemClock\_Config**(**void**);

**static** **void** **MX\_GPIO\_Init**(**void**);

**static** **void** **MX\_TIM1\_Init**(**void**);

/\* USER CODE BEGIN PFP \*/

/\* USER CODE END PFP \*/

/\* Private user code ---------------------------------------------------------\*/

/\* USER CODE BEGIN 0 \*/

**void** **delay\_ms**(uint16\_t ms) {

**for**(**int** i=0; i < ms; i++) {

htim1.Instance->CNT = 0;

HAL\_TIM\_Base\_Start(&htim1);

**while**(htim1.Instance->CNT < 999);

HAL\_TIM\_Base\_Stop(&htim1);

}

}

**void** **HAL\_GPIO\_EXTI\_Callback**(uint16\_t GPIO\_Pin) {

**if**(GPIO\_Pin == GPIO\_PIN\_1) {

flag = 1;

}

**if**(GPIO\_Pin == GPIO\_PIN\_2) {

flag = 2;

}

}

**void** **dong\_ho**() {

**for**(hh = 0; hh <= 24; hh++) {

**if**(hh <= 6 && hh >= 18) {

HAL\_GPIO\_WritePin(GPIOB, GPIO\_PIN\_12, 1);

}

**if**(hh > 6 && hh < 18){

HAL\_GPIO\_WritePin(GPIOB, GPIO\_PIN\_12, 0);

}

temp = hh / 10;

**if**(temp >= 1) {

LCD\_setCursor(0, 0);

LCD\_printf("%d", temp);

}

**if**(temp < 1) {

LCD\_setCursor(0, 0);

LCD\_printf(" ");

}

h = hh % 10;

LCD\_setCursor(0, 1);

LCD\_printf("%d", h);

**for**(mm = 0; mm <= 6; mm++) {

LCD\_setCursor(0, 3);

LCD\_printf("%d", mm);

**for**(m = 0; m <= 6; m++) {

LCD\_setCursor(0, 4);

LCD\_printf("%d", m);

**for**(ss = 0; ss <= 6; ss++) {

LCD\_setCursor(0, 6);

LCD\_printf("%d", ss);

**for**(s = 0; s <= 6; s++) {

LCD\_setCursor(0, 7);

LCD\_printf("%d", s);

delay\_ms(1000);

}

}

}

}

}

}

/\* USER CODE END 0 \*/

/\*\*

\* @brief The application entry point.

\* @retval int

\*/

**int** **main**(**void**)

{

/\* USER CODE BEGIN 1 \*/

/\* USER CODE END 1 \*/

/\* MCU Configuration--------------------------------------------------------\*/

/\* Reset of all peripherals, Initializes the Flash interface and the Systick. \*/

HAL\_Init();

LCD\_init();

/\* USER CODE BEGIN Init \*/

/\* USER CODE END Init \*/

/\* Configure the system clock \*/

SystemClock\_Config();

/\* USER CODE BEGIN SysInit \*/

/\* USER CODE END SysInit \*/

/\* Initialize all configured peripherals \*/

MX\_GPIO\_Init();

MX\_TIM1\_Init();

/\* USER CODE BEGIN 2 \*/

HAL\_TIM\_Base\_Init(&htim1);

/\* USER CODE END 2 \*/

/\* Infinite loop \*/

/\* USER CODE BEGIN WHILE \*/

**while** (1)

{

/\* USER CODE END WHILE \*/

LCD\_setCursor(0, 2);

LCD\_printf(":");

LCD\_setCursor(0, 5);

LCD\_printf(":");

dong\_ho();

**if**(flag == 1) {

m++;

}

**if**(flag == 2) {

hh++;

}

flag = 0;

/\* USER CODE BEGIN 3 \*/

}

/\* USER CODE END 3 \*/

}